

# AI-Powered Weather System with Disaster Prediction

**Cedric Ngendahimana and Ms. Fanny Chatola**

Department of Computer Science

DMI-St. John the Baptist University, Lilongwe, Malawi

cypscedricjr@gmail.com

**Abstract:** *This project develops an AI-powered weather system that aims to improve disaster prediction and preparedness through advanced machine learning algorithms and real-time meteorological data. By collecting data from the OpenWeatherMap API, the system analyzes key environmental indicators, including rainfall, temperature, and wind speed, to detect risks of floods, droughts, cyclones, hailstorms, and wildfires. Through machine learning models like linear regression and threshold-based heuristics, the system achieves high predictive accuracy for natural disasters.*

*This study demonstrates the effectiveness of AI in early warning systems, thus enhancing community preparedness and supporting timely interventions by authorities.*

*The threshold-based heuristics method involved setting predetermined weather condition limits based on historical disaster data, where surpassing these thresholds indicates high disaster risk. Linear regression was used to forecast variables like rainfall and temperature, essential for early warning in disaster management. Both techniques were implemented in tandem, with linear regression providing probabilistic outputs that feed into the heuristic system to improve prediction accuracy*

**Keywords:** AI (Artificial Intelligence), Weather Prediction, Natural Disaster Alerts, ML (Machine Learning), Disaster Preparedness, GIS (Geographic Information System), API (Application Programming Interface)